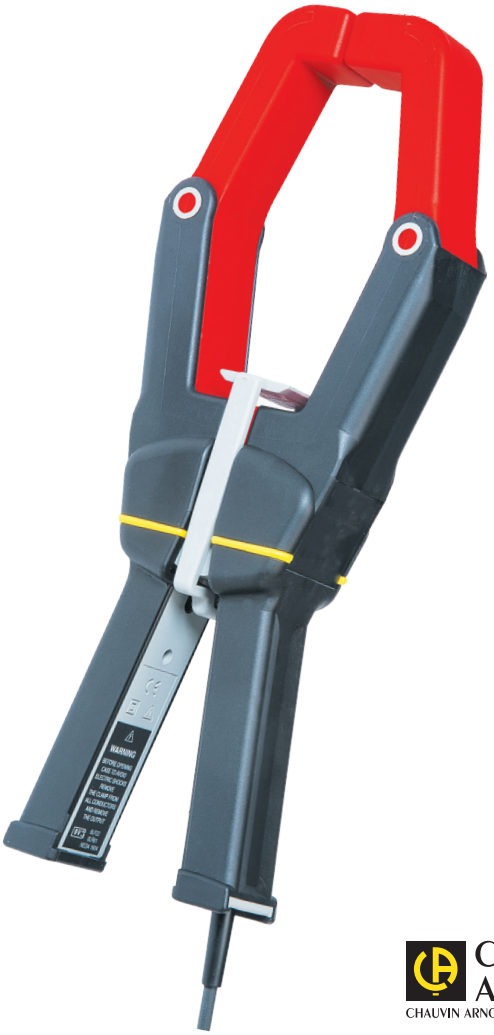
■ AC/DC CURRENT PROBE

J93



CHAUVIN® ARNOUX
CHAUVIN ARNOUX GROUP

AEMC® INSTRUMENTS
CHAUVIN ARNOUX GROUP

ENGLISH **User Manual**

Statement of Compliance

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments certifies that this instrument has been calibrated using standards and instruments traceable to international standards.

We guarantee that at the time of shipping your instrument has met its published specifications.

An NIST traceable certificate may be requested at the time of purchase, or obtained by returning the instrument to our repair and calibration facility, for a nominal charge.

The recommended calibration interval for this instrument is 12 months and begins on the date of receipt by the customer. For recalibration, please use our calibration services. Refer to our repair and calibration section at **www.aemc.com**.

Serial #: _____

Catalog #: 2140.49

Model #: J93

Please fill in the appropriate date as indicated:

Date Received: _____

Date Calibration Due: _____

AEMC® INSTRUMENTS

Chauvin Arnoux®, Inc.
d.b.a AEMC® Instruments
www.aemc.com

Thank you for purchasing an AEMC® Current Probe Model J93.

For best results from your instrument and for your safety, read the enclosed operating instructions carefully and comply with the precautions for use. These products must be only used by qualified and trained users.

	WARNING, risk of DANGER! The operator must refer to these instructions whenever this danger symbol appears.
	CAUTION! Risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.
	Application or withdrawal authorized on conductors carrying dangerous voltages. Type A current sensor as per IEC 61010-2-032.
	Equipment is protected by double insulation.
	Battery
	Important instructions to read and to fully understand.
	Useful information or tip to read.
	The CE marking guarantees conformity with European directives and with regulations covering EMC.
	The trash can with a line through it means that in the European Union, the product must undergo selective disposal for the recycling of electric and electronic material, in compliance with Directive WEEE 2002/96/EC.

Definition of Measurement Categories (CAT)

CAT IV Measurement category IV corresponds to measurements taken at the source of low-voltage installations.
Example: power feeders, counters and protection devices.

CAT III Measurement category III corresponds to measurements on building installations.
Example: distribution panel, circuit-breakers, machines or fixed industrial devices.

CAT II Measurement category II corresponds to measurements taken on circuits directly connected to low-voltage installations.
Example: power supply to domestic electrical appliances and portable tools.

⚠ PRECAUTIONS FOR USE ⚠

These current probes comply with safety standards EN 61010-1, EN 61010-031, and EN 61010-2-032 for voltages of 300V in Category IV or 600V Category III.

The protection obtained by the instrument can be compromised if it is used in a way that is not recommended by the manufacturer.

- The operator and/or the responsible personnel must carefully read and clearly understand the various precautions to be taken in use. Sound knowledge and a keen awareness of electrical hazards are essential when using this instrument.
- Do not use the clamp on networks at higher voltages or in higher categories than those mentioned.
- Do not use the clamp if it appears to be damaged or incorrectly closed.
- Before each use, check the condition of the insulation on the leads and housing. Any item of which the insulation is deteriorated (even partially) must be set aside for repair or scrapping.
- Always keep your fingers behind the physical safety guard.
- All troubleshooting and metrological checks must be performed by competent and accredited personnel.

Table of Contents

1. INTRODUCTION 4

1.1 Receiving Your Shipment 4

1.2 Ordering Information 4

1.2.1 Replacement Parts 4

2. PRODUCT FEATURES 5

2.1 Description 5

3. OPERATION 6

4. SPECIFICATIONS 7

4.1 Reference Conditions 7

4.2 Electrical 7

4.3 Variations in the Range of Use 8

4.4 Typical Curves 8

4.4.1 Typical Linearity Error in AC vs Current at 50Hz 8

4.4.2 Typical Phase Error vs Current at 50Hz 9

4.4.3 Typical Linearity Error in DC vs Current 9

4.4.4 Typical Amplitude Error vs Frequency 10

4.4.5 Typical Phase Error vs Frequency 10

4.5 Power Supply 11

4.6 Mechanical 11

4.7 Environmental 11

4.8 Safety 12

5. MAINTENANCE 13

5.1 Warning 13

5.2 Cleaning 13

5.3 Battery Replacement 14

5.4 Repair and Calibration 15

5.5 Technical and Sales Assistance 15

5.6 Limited Warranty 16

5.7 Warranty Repairs 16

1. INTRODUCTION

1.1 Receiving Your Shipment

Upon receiving your shipment, make sure that the contents are consistent with the packing list. Notify your distributor of any missing items. If the equipment appears to be damaged, file a claim immediately with the carrier and notify your distributor at once, giving a detailed description of any damage. Save the damaged packing container to substantiate your claim.

1.2 Ordering Information

AC/DC Current Probe Model J93
(for use with Models 8333, 8336, 8435 & the PEL Series).....**Cat. #2140.49**

Includes a soft carrying case, 9V battery, velcro fastener, set of 12 color-coded ID markers and user manual.

1.2.1 Replacement Parts

Soft Carrying Case .....**Cat. #2139.72**

Set of 12 Color-coded Input ID Markers .....**Cat. #2140.45**

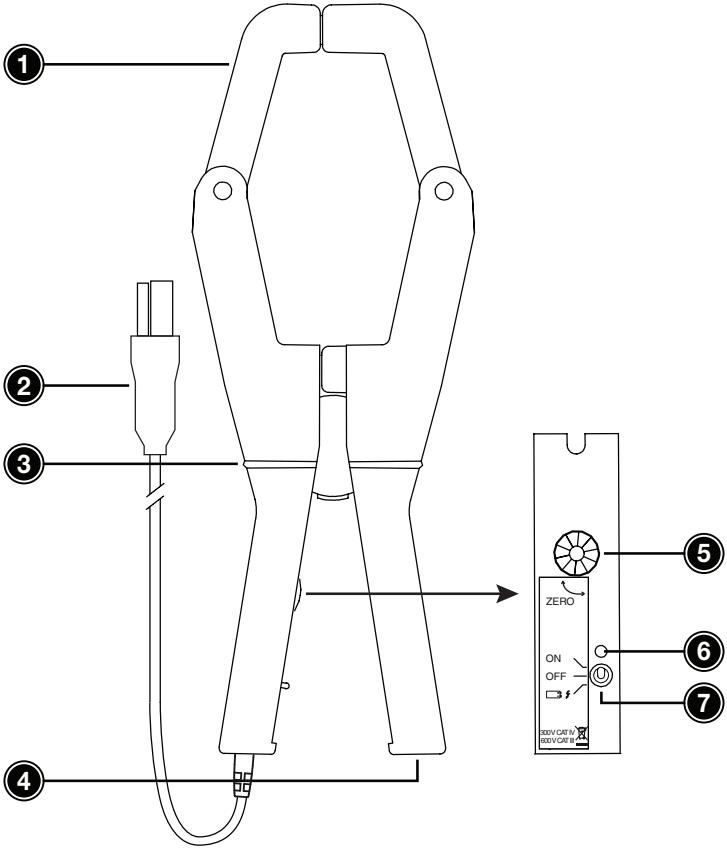
Order Accessories and Replacement Parts Directly Online
*Check our Storefront at **www.aemc.com** for availability*

2. PRODUCT FEATURES

2.1 Description

The Hall Effect Current Probe Model J93 is designed to measure DC currents up to 5000A and AC currents up to 3500A, without opening the circuit.

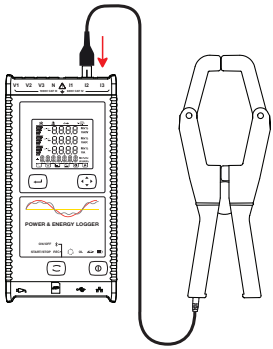
The Model J93 is powered by a 9V battery.



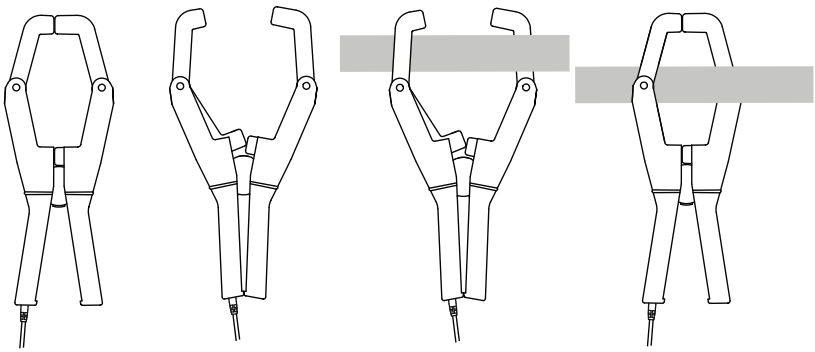
1. Jaw Ø 2.84" (72mm)
2. 4-point CA connector with 10 ft (3m) lead
3. Safety guard
4. Battery compartment cover
5. Zero adjustment knob
6. Power ON/Low battery indicator
7. Three-position switch: ON, OFF, battery test

3. OPERATION

- Set the switch to the position to check the battery status. If the battery indicator lights, the battery must be replaced (see §5.3).
- Set the switch to ON. The indicator lights.
- Connect the current probe to one of the current inputs on the device.
- Turn the device ON.
- Adjust the zero by watching the display of the device and turning the zero adjustment knob until the device displays 0.
- Open the jaws and clamp the conductor carrying the current to be measured. There must be only one conductor in the jaws of the clamp.



- Gently close the jaws. In order to optimize measurement quality, center the conductor as accurately as possible in the jaws.



- Read the measurement on the device.
- When the measurement is over, open the clamp and withdraw the conductor. Then disconnect the clamp from the device.
- Turn the device and clamp OFF.

4. SPECIFICATIONS

4.1 Reference Conditions

Quantity of influence	Reference Values
Temperature	23°C ±5°C
Relative humidity	20 to 75% RH
DC signal	With an AC signal of which the distortion factor is <0.1%
AC signal	45 to 65Hz with a DC signal <0.1%
Supply voltage	J93: 9V ± 0.1V
External electric field	Zero
External DC magnetic field (earth's field)	< 40 A/m
External AC magnetic field	Zero
Position of the conductor	centered in the probe jaws

4.2 Electrical

Measurement Range	50A to 3500A$_{AC}$ 50A to 5000A$_{DC}$
Sensitivity	1V / 3500A
Output impedance	≥ 100kΩ
Frequency	DC to 3kHz (-3 dB typical)

Primary Current (AC/DC)	50 to 100	100 to 500	500 to 2000	2000 to 3500	3500 to 5000 (DC only)
Amplitude error (see curve in §4.4.1)	± 2% ± 2.5A	± 1.5% ± 2.5A	± 1%	± 1%	± 1%
Phase error (see curve in §4.4.2)	4°	2°	1°	1.5°	–

Zero adjustment: ± 200A in 25 turns

4.3 Variations in the Range of Use

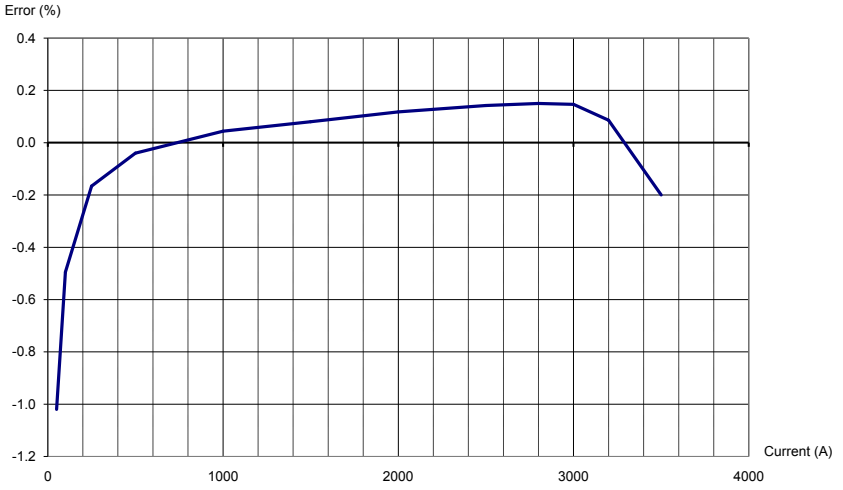
Quantity of influence	Range of influence	Accuracy
Temperature	14° to 131°F (-10° to 55°C)	< 0.7% / 18°F (10°C)
Relative humidity	10 to 90% RH	< 0.7%
Frequency response	DC at 2kHz	See curve in §4.4.4
Phase shift	DC at 2kHz	See curve in §4.4.5
Position of the conductor in the sensor	Any position [1]	< ± 2%
Conductor adjacent	Conductor touching the jaws [2]	Rejection > 35 dB
Battery voltage	J93: from 6.5 to 10V	± 2.25A typical
Remanence	at 5000A$_{DC}$	< 2A
Earth's magnetic field		< 0.5A

1: Test performed with a 40x30 mm² cable and a current of 3500A at 50Hz. The accuracy % is the ratio of the maximum variation to the mean value.

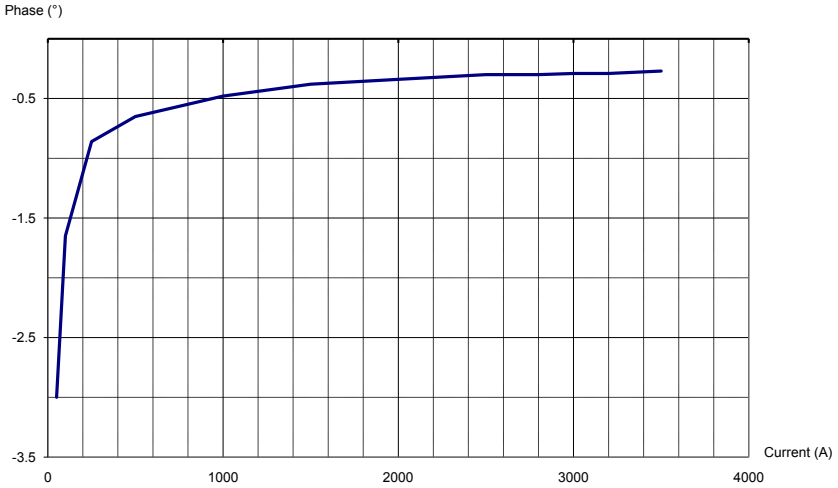
2: Test performed with a current of 300A at 50Hz.

4.4 Typical Curves

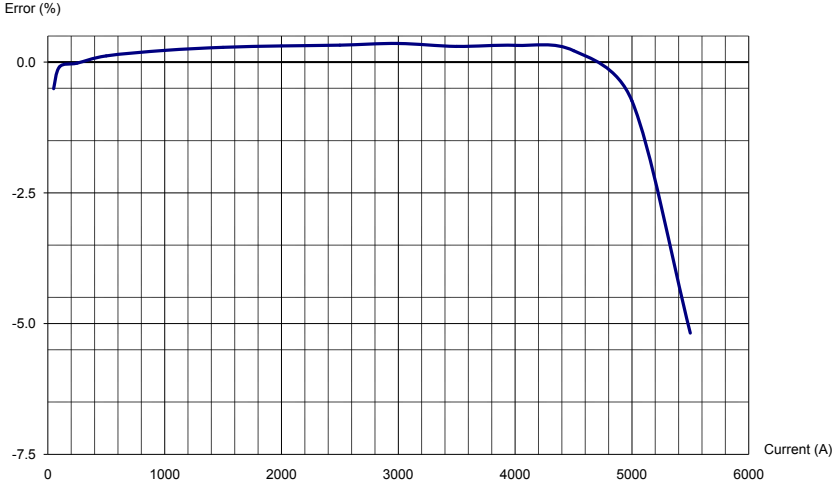
4.4.1 Typical Linearity Error in AC vs Current at 50Hz



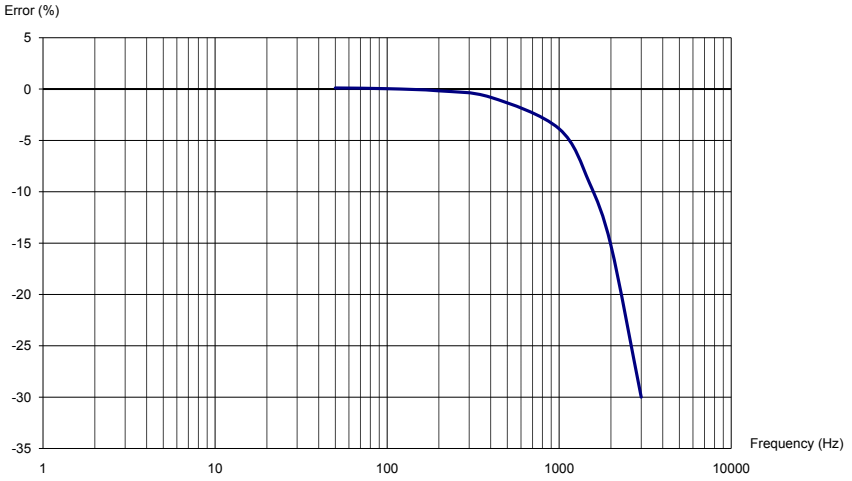
4.4.2 Typical Phase Error vs Current at 50Hz



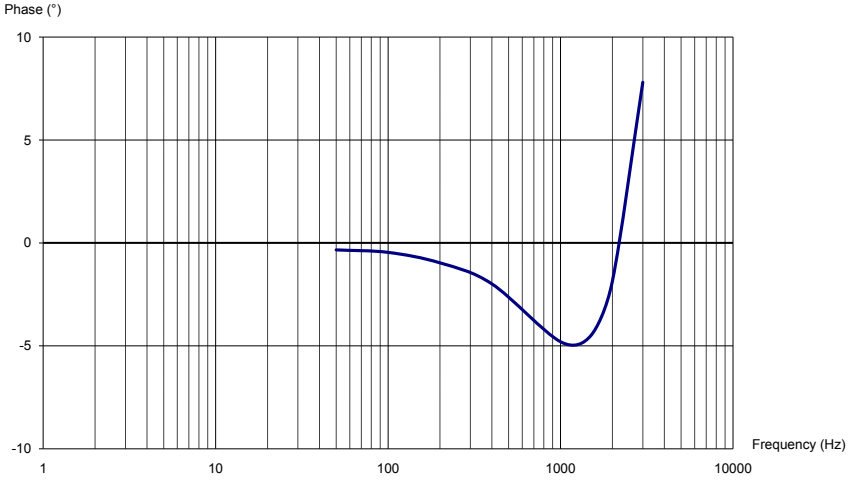
4.4.3 Typical Linearity Error in DC vs Current



4.4.4 Typical Amplitude Error vs Frequency



4.4.5 Typical Phase Error vs Frequency



4.5 Power Supply

- The power supply of the J93 clamp is provided by a 9V alkaline battery (type 6LF22, 6LR61, or NEDA 1604).
- The nominal operating voltage is between 6.5 and 10V.
- The battery life is 70 hours. The typical consumption is 11 mA.
- During the battery test, if the indicator lights, the clamp can be used.
- When the indicator no longer lights, the battery must be replaced (see §5.3).

4.6 Mechanical

Dimensions: 13.23 x 5.00 x 1.65" (336 x 127 x 42mm)

Jaw Opening: 2.84" (72mm)

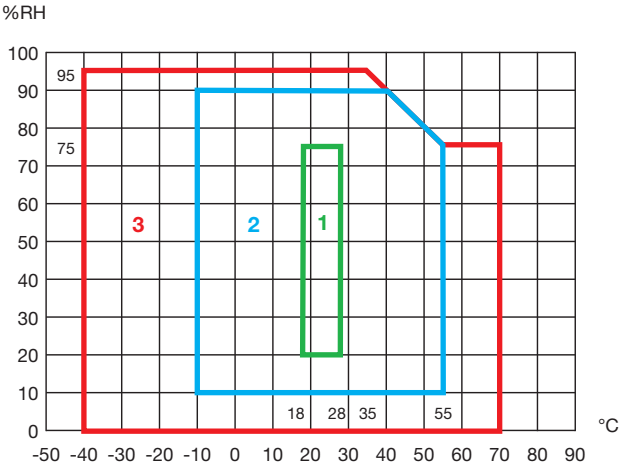
Lead: 10 ft (3m) long

Weight: 3.75 lbs (1.7kg) approx

Protection Index: IP20 according to IEC 60529

4.7 Environmental

The device must be used under the following conditions:



1: Reference range

2: Operating range

3: Storage range (without battery)

- For an extended period of non-use or storage, remove the battery from the J93 clamp
- Indoor use
- Degree of pollution: 2
- Altitude: <2000m

4.8 Safety

- Electrical safety according to IEC 61010-2-032 for type A sensors.
- Maximum applicable voltage: 600V CAT III; 300V CAT IV
- Electromagnetic compatibility (EMC)
- Emissions and immunity in an industrial environment in accordance with IEC 61326-1, except for immunity to the electric field with a criterion B.

5. MAINTENANCE

Use only factory specified replacement parts. AEMC® will not be held responsible for any accident, incident, or malfunction following a repair done other than by its service center or by an approved repair center.

5.1 Warning

- To ensure optimum performance, it is important to keep the probe jaw mating surfaces clean at all times. Failure to do so may result in error in readings.
- To avoid electrical shock, do not attempt to perform any servicing unless you are qualified to do so.
- Do not perform any service while the current probe is on any circuit.
- To avoid electrical shock and/or damage to the instrument, do not get water or other foreign agents into the electronic module.

5.2 Cleaning

Disconnect the instrument from any source of electricity.

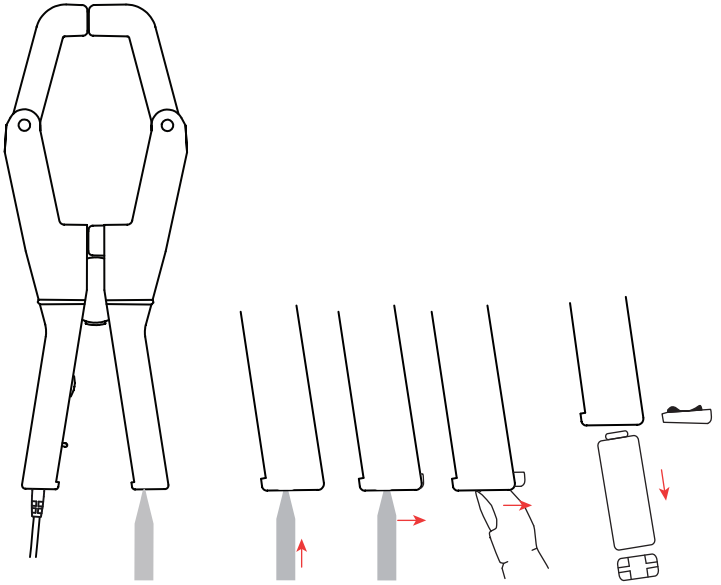
- Use a soft cloth, dampened with soapy water. Rinse with a damp cloth and immediately dry with a dry cloth.
- Do not use alcohol, solvents, or hydrocarbons.
- Do not splash water directly on the instrument.

5.3 Battery Replacement

Disconnect the instrument from any source of electricity.

To replace the battery, proceed as follows:

- Insert a tool, not more than 3mm in diameter, in the hole in the battery compartment cover.
- Push to unlock the battery compartment cover, then slide it off.
- Remove it completely by hand.
- Remove the battery and the shim from the compartment.



- Place the new battery in the compartment with the polarity as indicated on the label. Then replace the shim.
- Put the battery compartment cover back in the slide and push it in until you hear a click.

Used batteries must not be treated as ordinary household waste. Recycle them appropriately.

5.4 Repair and Calibration

To ensure that your instrument meets factory specifications, we recommend that it be scheduled back to our factory Service Center at one-year intervals for recalibration, or as required by other standards or internal procedures.

For instrument repair and calibration:
You must contact our Service Center for a Customer Service Authorization Number (CSA#). This will ensure that when your instrument arrives, it will be tracked and processed promptly. Please write the CSA# on the outside of the shipping container. If the instrument is returned for calibration, we need to know if you want a standard calibration, or a calibration traceable to N.I.S.T. (Includes calibration certificate plus recorded calibration data).

Ship To: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive
Dover, NH 03820 USA
Phone: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
Fax: (603) 742-2346 or (603) 749-6309
E-mail: repair@aemc.com

(Or contact your authorized distributor)

Costs for repair, standard calibration, and calibration traceable to N.I.S.T. are available.

NOTE: You must obtain a CSA# before returning any instrument.

5.5 Technical and Sales Assistance

If you are experiencing any technical problems, or require any assistance with the proper operation or application of your instrument, please call, mail, fax or e-mail our technical support team:

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
200 Foxborough Boulevard
Foxborough, MA 02035 USA
Phone: (800) 343-1391
(508) 698-2115
Fax: (508) 698-2118
E-mail: techsupport@aemc.com
www.aemc.com

NOTE: Do not ship Instruments to our Foxborough, MA address.

5.6 Limited Warranty

The Current Probe Model J93 is warranted to the owner for a period of one year from the date of original purchase against defects in manufacture. This limited warranty is given by AEMC® Instruments, not by the distributor from whom it was purchased. This warranty is void if the unit has been tampered with, abused or if the defect is related to service not performed by AEMC® Instruments.

Full warranty coverage and product registration is available on our website at **www.aemc.com/warranty.html.**

Please print the online Warranty Coverage Information for your records.

What AEMC® Instruments will do:
If a malfunction occurs within the one-year period, you may return the instrument to us for repair, provided we have your warranty registration information on file or a proof of purchase. AEMC® Instruments will, at its option, repair or replace the faulty material.

REGISTER ONLINE AT: www.aemc.com

5.7 Warranty Repairs

What you must do to return an Instrument for Warranty Repair:

First, request a Customer Service Authorization Number (CSA#) by phone or by fax from our Service Department (see address below), then return the instrument along with the signed CSA Form. Please write the CSA# on the outside of the shipping container. Return the instrument, postage or shipment pre-paid to:

Ship To: Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive
Dover, NH 03820 USA
Phone: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
Fax: (603) 742-2346 or (603) 749-6309
E-mail: repair@aemc.com

Caution: To protect yourself against in-transit loss, we recommend you insure your returned material.

NOTE: You must obtain a CSA# before returning any instrument.

Notes:

05/15

99-MAN 100397 v3

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive • Dover, NH 03820 USA • Phone: (603) 749-6434 • Fax: (603) 742-2346
www.aemc.com